

(No Model.)

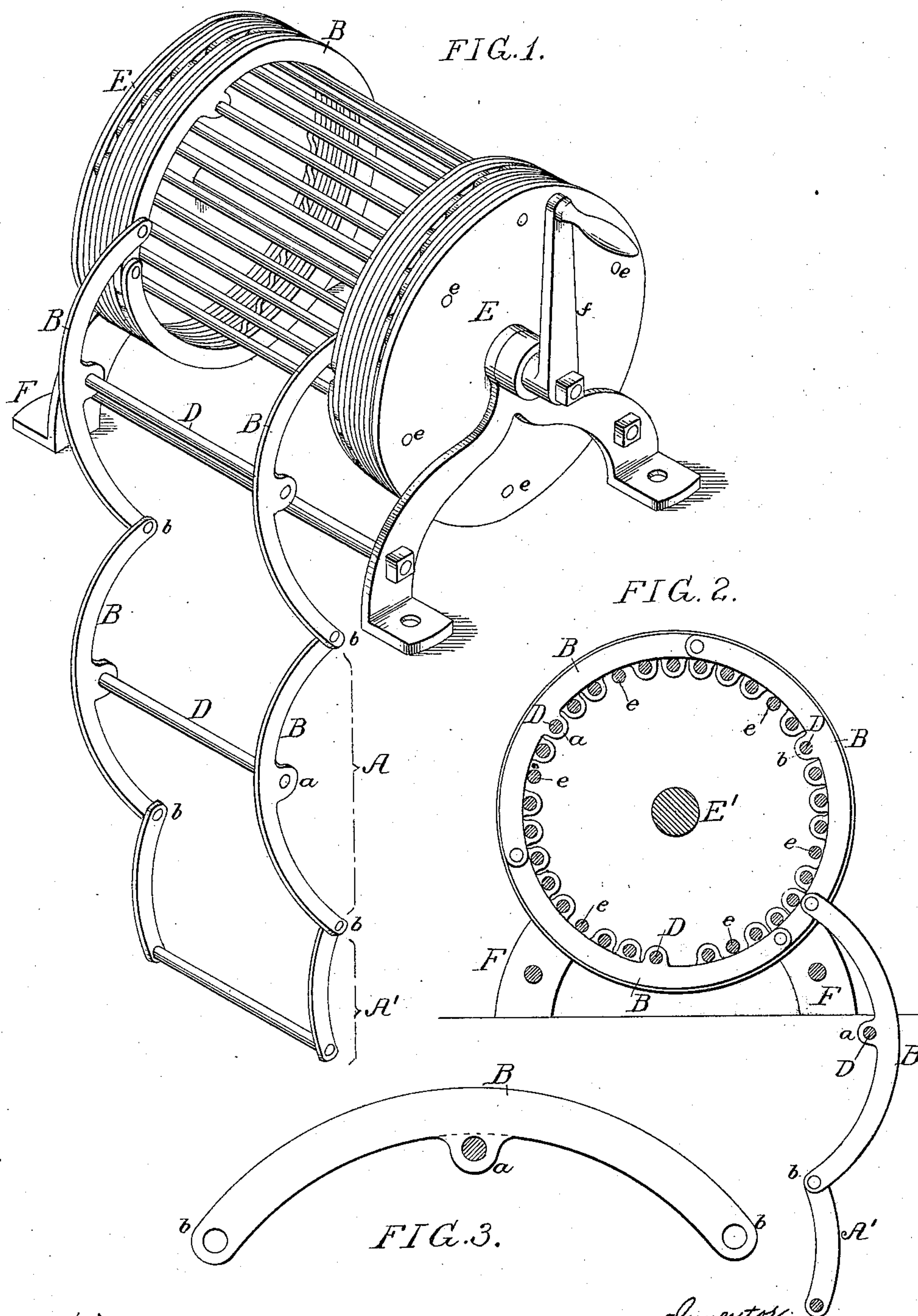
2 Sheets—Sheet 1.

T. S. DISSTON.

FOLDING LADDER.

No. 322,699.

Patented July 21, 1885.



Witnesses,
William F. Davis
Henry Bossert.

Inventor,
Thomas S. Disston
by his Attorneys
H. Wilson and Sons

(No Model.)

2 Sheets—Sheet 2.

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FIG. 4.

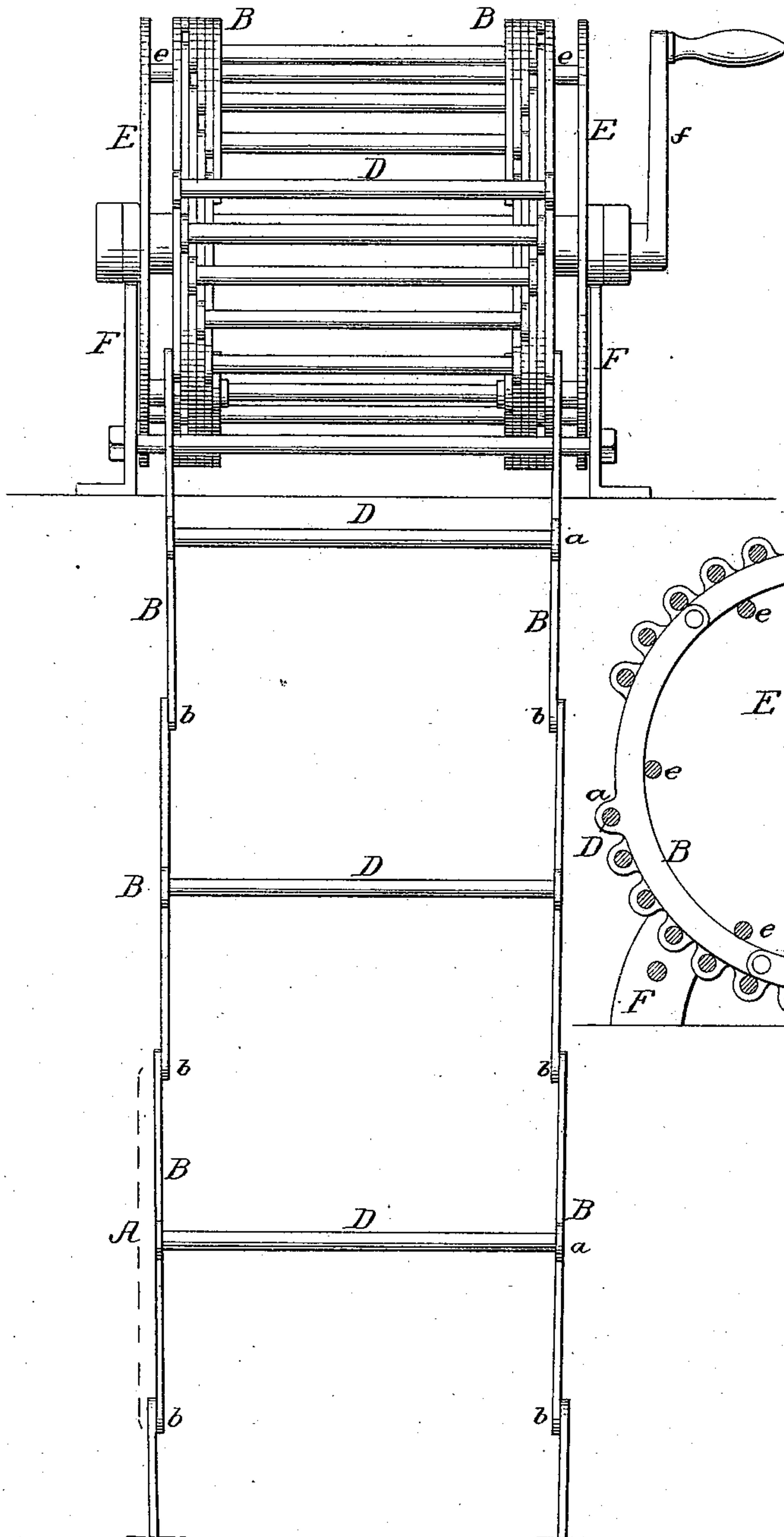
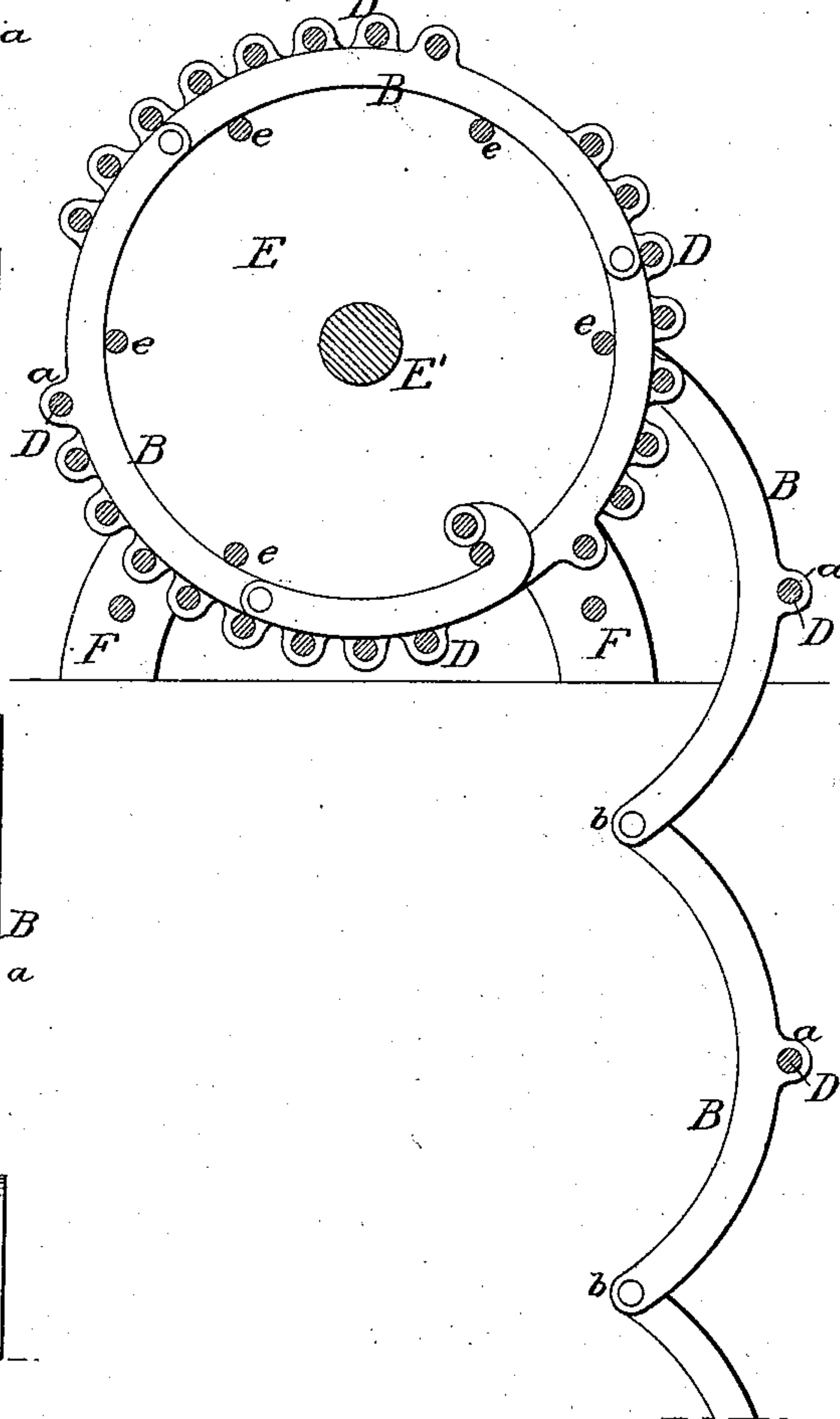


FIG. 5.



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UNITED STATES PATENT OFFICE.

THOMAS S. DISSTON, OF PHILADELPHIA, PENNSYLVANIA.

FOLDING LADDER.

SPECIFICATION forming part of Letters Patent No. 322,699, dated July 21, 1885.

Application filed May 25, 1885. (No model.)

To all whom it may concern:

Be it known that I, THOMAS S. DISSTON, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Folding Ladders, of which the following is a specification.

The main object of my invention is to so construct a folding ladder that it can be rolled up onto a spider or drum into a comparatively small compass, and this object I attain as hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a perspective view of the ladder as partially wound onto its receiving drum or spider. Fig. 2 is a vertical section of the same. Fig. 3 is an enlarged detached view of one of the side bars of each section of the ladder. Fig. 4 is a front view of a modification, and Fig. 5 is a vertical section of the same.

Ladders have heretofore been made in hinged sections with curved side bars and adapted to wind onto a drum; but in all such constructions, so far as I am aware, the continued winding of the convolutions onto the receiving drum would cause the coil to increase in diameter, owing to the riding of the side bars on each other or onto the cross-bars or rungs of the superposed sections.

I so construct my ladder that the successive sections, when the ladder is coiled up, will lie with their side bars side by side in the same annular plane. For this purpose I construct each section with its rung beyond the line or plane of the side bars, as hereinafter described.

Each section A of the ladder is composed of two side bars, B B, and a central cross-bar or rung, D, the sections being hinged to each other by headed pins or rivets *b* at the ends of the side bars, which latter are preferably cut out of plate iron or steel. These sections are so hinged to each other that when folded or coiled up one set (of three in the present instance) will lie within the next set, and in practice I prefer to make what will constitute the lowest section of the ladder the narrowest, while the widest section will be hinged or otherwise secured to the winding drum or spider, as shown in the construction illustrated in Figs. 1 and 2; but the bottom section may be made the widest, as shown in the modification, Figs. 4 and 5.

In the present instance I have shown the drum or spider as consisting of the two end plates, E E, mounted on a central shaft, E', and connected by tie rods *e*. The central shaft is mounted in bearings in a suitable frame, F, which can be secured to a floor or side wall, and the shaft is provided with an operating-handle, *f*, and may also have the usual pawl-and-ratchet stop mechanism, such as used on any winding-drum.

In the construction shown in Figs. 1, 2, and 3 it will be observed that the rung of each section is connected to the side bars below the line of said side bars, lugs *a* being formed on the side bars to receive the rung for this purpose. Consequently when care is taken in the construction of the ladder that the cross-bars shall not lie over each other when wound onto the drum the side bars of all the sections will lie side by side in the same annular plane.

For convenience of manufacture, I prefer to make all the side bars (except the last short section, A') of the same size, with their lugs *a* in the same central position, and care must therefore be taken to so proportion the diameter of the drum (constituted in this instance by the tie-rods *e*) to the lengths of the sections that the cross-bars of the sections when all are coiled up will lie one in advance of the other, as shown in the drawings, this being accomplished by making a certain number of sections (three in the present instance) equal to a little more or less than a complete circle.

Although I have shown three sections to each coil, the number of sections and the diameter of the drum may be varied according to the length of ladder desired.

In the modification, Figs. 4 and 5, where the section which is connected to the drum is the narrowest in width, the cross-bars or rungs D are connected to the side bars above the line of the latter, so that the rungs of the successive sections as they are wound up will lie over the side bars one in advance of the other, as illustrated.

I claim as my invention—

1. A drum carrying a coiled sectional ladder having the side bars of all the coiled sections in the same annular plane, as set forth.

2. A folding-ladder section composed of

side bars and a cross-bar or rung beyond the plane or line of the side bars, substantially as set forth.

3. A folding ladder having hinged sections, 5 and each composed of side bars and a cross-bar or rung beyond the plane or line of the side bars, as and for the purpose set forth.

4. The combination of the winding-drum with a folding ladder adapted to be coiled 1 thereon, said ladder being composed of hinged sections each consisting of curved side bars and a cross-bar or rung beyond the line or plane of the side bars, substantially as specified.

5. A folding-ladder section composed of 15 curved side bars, A, having projection lugs *a* and a cross-bar secured to said lugs, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 20 two subscribing witnesses.

THOS. S. DISSTON.

Witnesses:

HENRY BOSSERT,
HARRY SMITH.